

U.S. Patent Application Serial No. 10/583,000
Amendment filed April 24, 2009
Reply to OA dated December 29, 2008

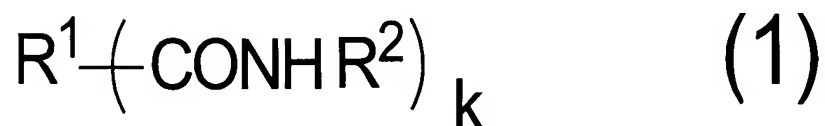
AMENDMENTS TO THE CLAIMS:

Please cancel claims 13, 14, 20-22, 24 and 26 without prejudice or disclaimer, amend claims 1, 2, 9, 10, 15, 16 and 27, and add new claims 32-40, as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

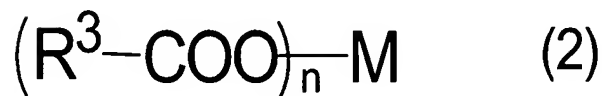
Claim 1 (Currently amended): A composition for controlling the crystallization rate of a polyolefin-based resin, the composition comprising:

(A) at least one amide-based compound represented by General Formula (1)



wherein R^1 represents a residue obtained by removing all the carboxyl groups of 1,2,3-propanetricarboxylic acid or 1,2,3,4-butanetetracarboxylic acid, k represents an integer of 3 or 4, and the three or four R^2 groups are the same or different, and each represent cyclohexyl or cyclohexyl substituted with one C_{1-10} linear or branched alkyl; and

(B) at least one fatty acid metal salt represented by General Formula (2)



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wherein R^3 represents a residue obtained by removing the carboxyl group from a C_{8-32} saturated or unsaturated aliphatic monocarboxylic acid which may have at least one hydroxyl group per molecule, n represents an integer of 1 or 2, when n is 2, the two R^3 groups may be the same or different, and M represents a monovalent or divalent metal,

the component (A): component (B) weight ratio being from ~~100:0~~ 95:5 to 30:70.

Claim 2 (Currently amended): The composition according to Claim 1, wherein the component (A): component (B) weight ratio is from ~~95:5 to 30:70~~ 90:10 to 60:40.

Claim 3 (Original): The composition according to Claim 1, wherein the three or four R^2 groups in General Formula (1) are the same or different and each represent cyclohexyl or cyclohexyl substituted with C_{1-4} linear or branched alkyl.

Claim 4 (Original): The composition according to Claim 1, wherein the three or four R^2 groups in General Formula (1) are the same or different and each represent cyclohexyl or 2-methyl-, 3-methyl- or 4-methyl-substituted cyclohexyl.

Claim 5 (Original): The composition according to Claim 1, wherein R^1 in General Formula (1) represents a residue obtained by removing all of the carboxyl groups from 1,2,3-propanetricarboxylic acid, and k is 3.

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Claim 6 (Original): The composition according to Claim 1, wherein M in General Formula (2) is at least one metal selected from the group consisting of alkali metals, alkaline earth metals and zinc.

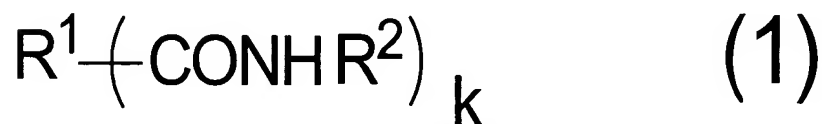
Claim 7 (Original): The composition according Claim 1, wherein R³ in General Formula (2) is a residue obtained by removing the carboxyl group from a C₁₀₋₁₈ saturated or unsaturated aliphatic monocarboxylic acid which may have at least one hydroxyl group per molecule.

Claim 8 (Original): The composition according to Claim 7, wherein the aliphatic monocarboxylic acid is at least one member selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, oleic acid, and 12-hydroxystearic acid.

Claim 9 (Currently amended): A method for controlling the crystallization rate of a polyolefin-based resin during molding of the polyolefin-based resin, the method comprising

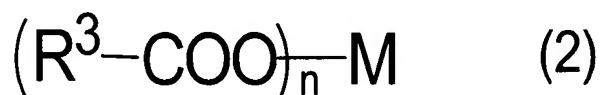
incorporating into the polyolefin-based resin a polyolefin-based resin crystallization rate-controlling composition comprising:

(A) at least one amide-based compound represented by General Formula (1)



wherein R¹ represents a residue obtained by removing all of the carboxyl groups from 1,2,3-propanetricarboxylic acid or 1,2,3,4-butanetetracarboxylic acid, k represents an integer of 3 or 4, and the three or four R² groups are the same or different and each represent cyclohexyl or cyclohexyl substituted with one C₁₋₁₀ linear or branched alkyl, and

(B) at least one fatty acid metal salt represented by General Formula (2)



wherein R³ represents a residue obtained by removing the carboxyl group from a C₈₋₃₂ saturated or unsaturated aliphatic monocarboxylic acid which may have at least one hydroxyl group per molecule, n represents an integer of 1 or 2, when n is 2, the two R³ groups may be the same or different, and M represents a monovalent or divalent metal, the weight ratio of component (A):component (B) being from ~~100:0~~ 95:5 to 30:70, or

incorporating component (A) and component (B), simultaneously or separately, into the polyolefin-based resin such that the weight ratio of component (A) : component(B) is from ~~100:0~~ 95:5 to 30:70

to thereby give a polyolefin-based resin composition, and
molding the resin composition.

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Claim 10 (Currently amended): The method according to Claim 9, wherein the weight ratio of component (A) : component (B) is from ~~95:5 to 30:70~~ 90:10 to 60:40.

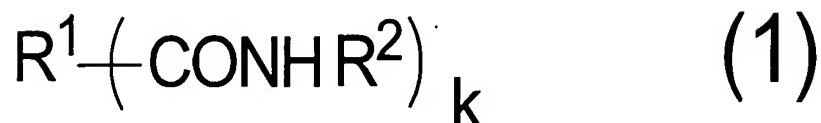
Claim 11 (Original): The method according to Claim 9, wherein the resin composition is molded at a resin temperature higher than the transition temperature of storage modulus during heating.

Claim 12 (Original): The method according to Claim 9, wherein the resin composition is molded at a resin temperature not lower than the melting temperature of the polyolefin-based resin and not higher than the transition temperature of storage modulus during heating.

Claims 13-14 (Canceled).

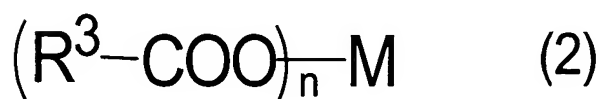
Claim 15 (Currently amended): A process for producing a polyolefin-based resin molded product, the process comprising
incorporating into a polyolefin-based resin a polyolefin-based resin crystallization rate-controlling composition comprising:

(A) at least one amide-based compound represented by General Formula (1)



wherein R^1 represents a residue obtained by removing all of the carboxyl groups from 1,2,3-propanetricarboxylic acid or 1,2,3,4-butanetetracarboxylic acid, k represents an integer of 3 or 4, and the three or four R^2 groups are the same or different and each represent cyclohexyl or cyclohexyl substituted with one C_{1-10} linear or branched alkyl, and

(B) at least one fatty acid metal salt represented by General Formula (2)



wherein R^3 represents a residue obtained by removing the carboxyl group from a C_{8-32} saturated or unsaturated aliphatic monocarboxylic acid which may have at least one hydroxyl group per molecule, n represents an integer of 1 or 2, when n is 2, the two R^3 groups may be the same or different, and M represents a monovalent or divalent metal, the weight ratio of component (A):component (B) being from ~~100:0~~ 95:5 to 30:70, or

incorporating component (A) and component (B), simultaneously or separately, into a polyolefin-based resin such that the weight ratio of component (A) : component(B) is from ~~100:0~~ 95:5 to 30:70

to thereby give a polyolefin-based resin composition, and
molding the resin composition.

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Claim 16 (Currently amended): The process according to Claim 15, wherein the weight ratio of component (A) : component (B) is from ~~95:5 to 30:70~~ 90:10 to 60:40.

Claim 17 (Original): The process according to Claim 15, wherein the resin composition is molded at a resin temperature higher than the transition temperature of storage modulus during heating.

Claim 18 (Original): The process according to Claim 15, wherein the resin composition is molded at a resin temperature not lower than the melting temperature of the polyolefin-based resin and not higher than the transition temperature of storage modulus during heating.

Claim 19 (Original): A process according to Claim 18, comprising the step of molding a molten polyolefin-based resin composition comprising a network structure formed of fibrous particles of an amide-based compound represented by the formula (1-p)



wherein R^{1P} represents a residue obtained by removing all of the carboxyl groups from 1,2,3-propanetricarboxylic acid, and the three R^{2P} groups are the same or different and each represent

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cyclohexyl or cyclohexyl substituted with one C₁₋₄ linear or branched alkyl, under temperature conditions such that the fibrous particles constituting the network structure do not dissolve or melt.

Claims 20-22 (Canceled).

Claim 23 (Original): The process according to Claim 19, wherein the polyolefin-based resin composition containing the network structure formed of said fibrous particles is molded by a molding method comprising an injection step or an extrusion step.

Claim 24 (canceled).

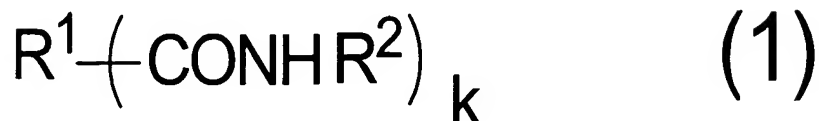
Claim 25 (Original): The process according to Claim 15, wherein said polyolefin-based resin is at least one member selected from the group consisting of propylene homopolymers and propylene copolymers.

Claim 26 (Canceled).

Claim 27 (Currently amended): A polyolefin-based resin molded product comprising:

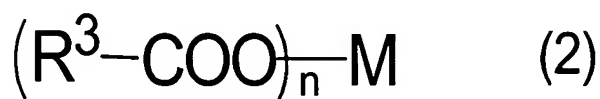
a polyolefin-based resin,

(A) at least one amide-based compound represented by General Formula (1)



wherein R^1 represents a residue obtained by removing all of the carboxyl groups from 1,2,3-propanetricarboxylic acid or 1,2,3,4-butanetetracarboxylic acid, k represents an integer of 3 or 4, and the three or four R^2 groups are the same or different and each represent cyclohexyl or cyclohexyl substituted with one C_{1-10} linear or branched alkyl, and

(B) at least one fatty acid metal salt represented by General Formula (2)

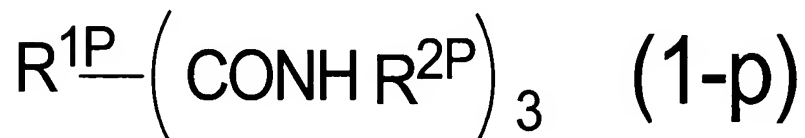


wherein R^3 represents a residue obtained by removing the carboxyl group from a C_{8-32} saturated or unsaturated aliphatic monocarboxylic acid which may have at least one hydroxyl group per molecule, n represents an integer of 1 or 2, when n is 2, the two $[[R^3]]$ R^3 groups may be the same or different and M represents a monovalent or divalent metal,

the weight ratio of component (A) : component (B) being from 100 : 0 to 30 : 70,
 the molded product having an orientation degree represented by the ratio of the (040) reflection intensity to the (110) reflection intensity determined by wide angle X-ray diffractometry of at least 2.

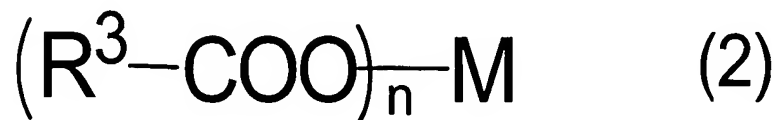
Claim 28 (Original): A polyolefin-based resin molded product comprising:
 a polyolefin-based resin, and

(a) at least one amide-based compound represented by the formula (1-p)



wherein R^{1P} represents a residue obtained by removing all of the carboxyl groups from 1,2,3-propanetricarboxylic acid, and the three R^{2P} groups are the same or different and each represent cyclohexyl or cyclohexyl substituted with one C_{1-4} linear or branched alkyl, or

(b) said at least one amide-based compound represented by General Formula (1-p) and at least one fatty acid metal salt represented by General Formula (2)



wherein R^3 represents a residue obtained by removing the carboxyl group from a C_{8-32} saturated or unsaturated aliphatic monocarboxylic acid which may have at least one hydroxyl group per molecule, n represents an integer of 1 or 2, when n is 2, the two R^3 groups may be the same or different and M represents a monovalent or divalent metal,

the molded product having an orientation degree represented by the ratio of the (040) reflection intensity to the (110) reflection intensity determined by wide angle X-ray diffractometry of at least 2.

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Claim 29 (Original): A polyolefin-based resin composition comprising a polyolefin-based resin and a crystallization rate-controlling composition of Claim 1.

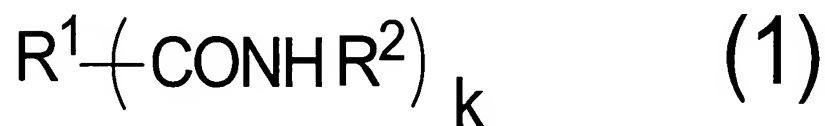
Claim 30 (Original): The polyolefin-based resin composition according to Claim 29 comprising the crystallization rate-controlling composition in an amount of 0.01 to 10 parts by weight per 100 parts by weight of the polyolefin-based resin.

Claim 31 (Original): A polyolefin-based resin molded product obtainable by molding the polyolefin-based resin composition of Claim 29.

Claim 32 (New): The polyolefin-based resin composition according to claim 29 wherein the weight ratio of component (A): component (B) is in the range from 95:5 to 30:70.

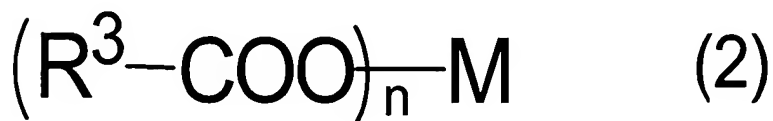
Claim 33 (New): A process for producing a polyolefin-based resin molded product, comprising the steps of molding a molten polyolefin-based resin composition comprising:

a network structure formed of fibrous particles of (A) an amide-based compound represented by the formula (1)



wherein R¹ represents a residue obtained by removing all of the carboxyl groups from 1,2,3-propanetricarboxylic acid or 1,2,3,4-butanetetracarboxylic acid, k represents an integer of 3 or 4, and the three of four R² groups are the same or different and each represent cyclohexyl or cyclohexyl substituted with one C₁₋₁₀ linear or branched alkyl, and

(B) at least one fatty acid metal salt represented by General Formula (2)



wherein R³ represents a residue obtained by removing the carboxyl group from a C₈₋₃₂ saturated or unsaturated aliphatic monocarboxylic acid which optionally has at least one hydroxyl group per molecule, n represents an integer of 1 or 2, when n is 2, the two R³ groups may be the same or different, and M represents a monovalent or divalent metal,

the weight ratio of component (A): component (B) being from 100:0 to 30:70, under temperature conditions such that the fibrous particles constituting the network structure do not dissolve or melt.

Claim 34 (New): The process according to claim 33 comprising the steps of:

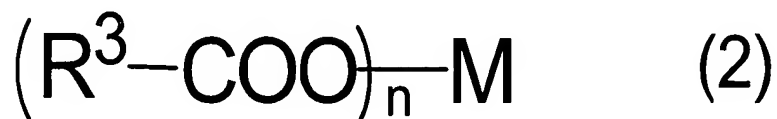
(a) dissolving said at least one amide-based compound represented by the formula (1) in a molten polyolefin-based resin to prepare a molten mixture,

(b) cooling the molten mixture to a temperature not higher than the transition temperature of storage modulus during cooling to obtain a polyolefin-based resin composition containing a network structure formed of fibrous particles of said at least one amide-based compound represented by the formula (1), and

(c) molding the polyolefin-based resin composition at a resin temperature not lower than the melting temperature of the polyolefin-based resin and not higher than the transition temperature of storage modulus during heating.

Claim 35 (New): The process according to claim 33, wherein said polyolefin-based resin composition is in the form of pellets.

Claim 36 (New): The process according to claim 33, wherein said polyolefin-based resin composition further contains at least one fatty acid metal salt represented by the formula (2)



wherein R^3 represents a residue obtained by removing the carboxyl group from a C_{8-32} saturated or unsaturated aliphatic monocarboxylic acid which may have at least one hydroxyl group per molecule, n represents an integer of 1 or 2, when n is 2, the two R^3 groups may be the same or different, and M represents a monovalent or divalent metal.

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Claim 37 (New): The process according to claim 33, wherein the polyolefin-based resin composition containing the network structure formed of said fibrous particles is molded by a molding method comprising an injection step or an extrusion step.

Claim 38 (New): The process according to claim 33, wherein said molding method comprising an injection step or an extrusion step is injection molding, extrusion molding, injection-blow molding, injection-extrusion blow molding, injection-compression molding, extrusion-blow molding, injection-compression molding, extrusion-blow molding, extrusion-thermoforming or melt-spinning.

Claim 39 (New): The process according to claim 33, wherein said polyolefin-based resin is at least one member selected from the group consisting of propylene homopolymers and propylene copolymers.

Claim 40 (New): A polyolefin-based resin molded product prepared by the process of claim 33 and having an orientation degree represented by the ratio of the (040) reflection intensity to the (110) reflection intensity determined by wide angle X-ray diffractometry of at least 2.